trichia Fr. Braun from the Mesozoic of Franconia is introduced. The result of the present important communication is to enlarge our knowledge of the male organs of the Bennettitales by seven different species belonging to five different types. Two species of *Williamsonia* have monosporangiate strobili. The same condition is clearly demonstrated in *Cycadocephalus*. The author wisely refuses to commit himself as to the nature of the Bennettitean inflorescence, and avoids any reference to its possible homology with the angiospermous flower. —E. C. JEFFREY.

Rôle of ammonium salts.—PRIANISCHNIKOW,[15] working with grasses, has already shown that a substitution in sand cultures of $\frac{1}{4}$–$\frac{3}{4}$ of the $NaNO_3$ by $(NH_4)_2SO_4$ increases the power of the plant to gain phosphoric acid from raw phosphates (phosphorite), while in absence of $(NH_4)_2SO_4$ the plants show phosphoric acid starvation. Total substitution, however, greatly reduces the harvest. Both these effects are attributed to the released sulfuric acid. In partial substitution the acid was strong enough to aid in dissolving the phosphorite, and in total substitution so strong that it greatly injured the plants. It is also shown that $CaCO_3$ is very effective in preventing injuries by $(NH_4)_2SO_4$, and if only $\frac{1}{4}$–$\frac{1}{2}$ enough was used to neutralize the liberated sulfuric acid, the consumption of the phosphorite was also much favored. In working with barley, peas, and buckwheat, the author has determined that mixtures of $NaNO_3$ and $(NH_4)_2SO_4$ are better sources of nitrogen than either one alone, for, as he states, the first is physiologically basic (base liberated due to the consumption of NO_3 as source of nitrogen) and the second physiologically acid (acid liberated due to the consumption of NH_4 as the source of nitrogen). The two maintain the culture medium neutral. The author does not attempt to decide between the relative values of ammonium salts and nitrates as a source of nitrogen when the former are of very weak acids, as those used by RITTER[16] to settle this question for fungi.—WILLIAM CROCKER.

Fossil conifers.—NATHORST[17] has described with truly admirable clearness and judgment the cones of the problematical coniferous genus *Palissya* from the Rhaetic of Schonen in Sweden. The ovuliferous cone scales are characterized by the presence of two rows of opposite seeds, with very loose integuments or epimatia. The author concludes that the evidence of the organization of the cone scales tends to connect the genus with a second genus described in the article, namely *Stachytaxus*. This genus has yewlike foliage, and attached to the ends of the twigs are lax cones with distant scales, each of which bears two ovules, provided with a widely flaring integument or possibly an epimatium comparable with that found in the Taxineae. The author argues for the taxineous affinities

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[15] PRIANISCHNIKOW, D., Zur physiologischen Characteristik der Ammoniumsalze. Ber. Deutsch. Bot. Gesell. **26**[2]:716–724. 1909.

[16] Ber. Deutsch. Bot. Gesell. **27**:582–588. 1909.

[17] NATHORST, A. G., Paleobotanische Mitteilungen. 7. Handl. Kgl. Svensk. Vetensk.-Akad. **43**: no. 8. 1909.

of *Stachytaxus*, and by implication for the similar relationship of *Palissya*. The only real evidence for the affinity of these two genera with the Taxineae seems to rest on the possible presence of an epimatium in connection with the seeds. It seems not improbable that they are really representatives of an araucarian stock different from any now in existence. Some of the later mesozoic Araucarineae possess both the biovulate cone scale and the flaring integument of the genera under discussion. Present indications are that all the mesozoic conifers will ultimately be arranged either under the Abietineae or the Araucarineae in the broader sense.—E. C. JEFFREY.

Orchid flowers and formative stimuli.—FITTING'S work on the effect of pollination and other stimuli upon the postfloration behavior of orchid flowers has been reviewed in this journal.[18] In a second paper,[19] he gives an account of further experimentation of the same kind, and concludes that the changes induced in the perianth, gynostemium, and ovary are at most six, namely: (1) shortening of the life of the perianth, (2) lengthening of the life of the perianth, (3) closing of the flower, (4) swelling of the ovary and gynostemium, (5) fading of the perianth, (6) greening of the ovary and perianth. Each of these may result separately or with several others, in various combinations. Although it seems probable that the influence of the pollen is due to a chemical substance soluble in water and alcohol, FITTING was unable to isolate it in pure form or to identify it. It was determined, by extracting pollen of *Cattleya Trianaei* with water and hot alcohol, that this chemical substance is not found inside the pollen grain, but merely adheres to it and can be removed without injury to the pollen. By using the pollen from which this substance has been removed, the effects of the pollen tube alone can be studied, when it is found that the tube produces the same results as the active substance. This is not due to the substance secreted by the tube or carried down from the pollen grain, but to an unknown factor.—R. CATLIN ROSE.

A new case of apogamy.—*Burmannia coelestis*, as described by ERNST,[20] furnishes a case of apogamy somewhat different from any hitherto reported. From the cells of the egg apparatus of an eight-nucleate embryo sac with diploid nuclei, one and often two and sometimes three embryos are produced. The formation of a tetrad of megaspores is either irregular or completely suppressed, as is already known to be the case in most apogamous forms previously described. No synapsis stage or heterotypic mitosis was observed. The number of chromosomes was not determined, but is greater than in normally fertilized species of *Burmannia*. The anticipated irregularities in the pollen were found, and the

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[18] BOT. GAZETTE **47**:479. 1909.

[19] FITTING, H., Weitere entwickelungsphysiologische Untersuchungen an Orchideenblüten. Zeitschr. Bot. **2**:225–267. 1910.

[20] ERNST, A., Apogamie bei *Burmannia coelestis* Don. Ber. Deutsch. Bot Gesell. **27**:157–168. *pl.* 7. 1909.